Sam Houston State College
ESTILL LIBRARY
Huntsville, Texas 77341
WITHDRAWN

LB1570
.H6

Copyright, 1928, by TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Printed in the United States of America by
J. J. LITTLE AND IVES COMPANY, NEW YORK

ACKNOWLEDGMENTS

TO Professor Edward L. Thorndike I am indebted for the inspiration to undertake this study, and to Professor Frank M. McMurry I am grateful for needed guidance during the early stages of the investigation. Professors William H. Kilpatrick and William A. McCall were generous with helpful suggestions.

My thanks are due to the many school officials and teachers of Maryland who made it possible to secure the necessary data. A fine professional spirit was manifested by all who were asked to coöperate in the experiment.

I am under special obligation to the committee whose wise counsel and unselfish assistance enabled me to bring the study to a conclusion, Professors Milo B. Hillegas, Frederick G. Bonser, Fannie W. Dunn, and Edward S. Evenden.

W. J. H.

CONTENTS

CHAPTER		PAGE
I.	THE PROBLEM AND PROCEDURE	1
II.	THE CONDITIONS OF THE EXPERIMENT	5
III.	THE EQUIVALENCE OF GROUPS WITHIN A COUNTY	13
IV.	STATISTICAL DATA OF THE EXPERIMENT PERTAINING TO PUPILS	18
V.	A PROFESSIONAL ACHIEVEMENT TEST FOR TEACHERS	36
VI.	COUNTY COURSES OF STUDY	48
VII.	SOME CONCLUDING OBSERVATIONS	52

CURRICULUM MAKING AS A MEANS OF SUPERVISION

CHAPTER I

THE PROBLEM AND PROCEDURE

STATEMENT OF THE PROBLEM

No more pressing problem is presented to the hard-worked superintendent of schools than that of providing for his teachers and the children under their care a valid and workable curriculum. The desirable aims and ends of education are to be realized through the ideals and the activities embodied in the curriculum. The efficiency, the enthusiasm, and the professional spirit of the teaching staff are determined in large measure by the character of the curriculum and the manner in which it is made and administered.

The executive officer of a school system, as soon as he attempts to formulate a curriculum or modify an existing one, is confronted with a number of interesting problems. Should the teachers participate in curriculum making? What will be the effect of teacher participation upon the professional knowledge and skill of the teachers? How will such participation affect the progress of the pupils in the common school branches?

This investigation was undertaken with a view to determining valid answers to these important and perplexing educational questions.

THE METHOD

In four of the ten counties participating in the experiment upon which this discussion is based, the method employed was that of ranking teachers in order of the value of their respective contributions to courses of study, and determining the coefficient of correlation between these ranks and the ranks of the schools taught by these teachers in respect to the progress made by their pupils in certain school functions. In the remaining six counties, the equivalent-groups method was used, whereby a group of teachers,

S. H. S. T. C. LIBRARY

known as the experimental group, should actively engage in the preparation of courses of study, while a control group, as nearly equivalent to the experimental group as possible, should undergo the usual course of supervision but give no attention to curriculum making. These two methods of measuring growth of teachers and pupils will be discussed in the next chapter.

In all of the counties coöperating in this study the standings of the children in seven school functions were determined during the month of October. Then followed six months of intensive work on units of curricula. In the counties which employed the equivalent-groups method this work was done by the teachers in the experimental groups; in the other counties, by all the teachers who constituted one supervisory group. The standings of the children in the experimental groups and the control groups were again determined just before the close of the school year. The one exception to this procedure was a county in which the experiment was conducted for two years instead of one, and the children of the experimental and the control group were measured near the close of the second year. The difference in improvement made by the two groups in the functions in which the children were tested during the intervening six months in four of the counties, and one year and six months in one county, was credited to the effect of curriculum making. The children in the four counties not using the equivalent-groups method and those in one of the counties which employed this method were not tested a second time, for reasons which will be hereafter explained.

The teachers themselves were tested similarly in a manner to be hereafter explained. (Chapter V)

THE RESULTS

1. The teachers of the experimental groups made as much progress in professional spirit, attitude, and teaching skill in every county under investigation as did the teachers of the control groups. In addition, the teachers of the experimental groups continued to improve in the years immediately following this experiment at a faster rate than did the teachers of the control groups.

2. The children in the schools constituting the experimental groups made on the whole slightly greater gains in the functions tested than did the children with whom they were compared.

The related values of teacher participation in curriculum making were so great that it was well worth while for teachers actively to engage in the formulation of courses of study.

3. In the schools of the experimental groups, all of the children in Grades 3 to 7, inclusive, made satisfactory progress, with slightly greater gains in Grades 3 and 4.

4. The teachers engaged in curriculum making did very much more professional reading than they had ever done before in any one year, and more than the teachers of the control groups did during the period under investigation.

5. The elementary school supervisors were stimulated to greater activity as students of professional literature, and they expressed their belief that they became more skillful in the performance of their duties as helping teachers.

6. The communities served by the schools in the experimental groups were brought into closer relation to the work of the schools through the growing power of initiative on the part of the teachers, and the vitalizing effect of the several curriculum-making projects.

CONCLUSIONS

1. True democracy in supervision requires that all teachers in service be encouraged to participate freely, and as fully as their abilities permit, in all activities that have to do with the improvement of classroom instruction.

2. A means of supervision upon which too little emphasis has generally been placed is the course of study itself. Administrative coöperation in the making of courses of study for all types of schools is a most effective means of securing (*a*) professional growth of teachers in service, (*b*) a broader understanding and a deeper sympathy between supervisors and the teaching force, and (*c*) an exercise of initiative, at present too little in evidence.

3. Every teacher may be expected to make some contribution to the curriculum, if only a unit of subject matter, a lesson plan, or an intelligent criticism of the offerings of others. The extent and character of her contribution are determined by her natural endowments, her professional training, her desire for service, and the encouragement extended by the supervisor.

4. The final measure of the efficiency of any administrative or supervisory instrument is the extent to which it benefits the children. A course of study prepared by so-called experts with

only incidental and unorganized assistance of the general staff of teachers, however excellent it may be from a theoretical standpoint, is a failure if it does not stimulate the intelligent and enthusiastic support of the average classroom teacher. The course of study most likely to be administered successfully is the one made through democratic coöperation between the superintendent and the supervisors and all the teachers working in the field under consideration. A committee will be satisfactory, provided its members are not all chosen primarily because of their abilities for this work; it is of major importance that all types of teachers and all districts be represented.

5. A course of study made in accordance with the foregoing principles will stand the test of scientific scrutiny, considering (*a*) choice of material, (*b*) the best classroom procedure, and (*c*) the learning process.

6. The teachers and supervisory officials who participated in this study are practically unanimous in their belief that teacher participation in curriculum making tends to make such teachers more efficient as classroom instructors than if supervised in the "usual way."

CHAPTER II

THE CONDITIONS OF THE EXPERIMENT

COUNTIES IN WHICH THE EXPERIMENT WAS CONDUCTED

It was decided to make a test in Maryland of the value of teacher participation in curriculum making and the extent to which the initiative of teachers in service in elementary schools may be relied upon for the production of worth-while contributions to curricula. This state offered peculiarly favorable advantages as a field for such experiment for two reasons:

1. The county unit system of school organization in Maryland makes possible uniform procedure throughout the entire school system.

2. The Maryland School Laws make the following provision concerning the preparation of courses of study:

> The State Superintendent of Schools shall prepare, or cause to be prepared, and submit for approval and adoption by the State Board of Education, courses of study for the different grades and kinds of elementary schools, high schools, and normal schools, and also college courses for teachers.
>
> Maryland Public School Laws, 1927
> Chapter 3A, Section 32

> The county board of education, subject to the provisions of this article, the by-laws, courses of study and policies of the State Board of Education, shall prescribe, on the written recommendation of the county superintendent, courses of study for the schools under their jurisdiction, and a printed copy of these courses of study shall be supplied to every teacher and to every interested citizen of the county.
>
> *Ibid.*, Chapter 4, Section 53

> The county superintendent of schools shall prepare courses of study, subject to the rules and regulations and the courses of study of the State Board of Education, for the public schools of the county, and shall recommend he same for adoption by the county board of education.
>
> *Ibid.*, Chapter 4A, Section 143

Under these provisions of law, several counties had, when this experiment was initiated, already put courses of study of varying kinds and values into the hands of teachers. Baltimore County was using in its elementary graded schools a course of study of exceptional merit,[1] and was engaged in the adaptation of this course of study to the special needs of its rural schools. Carroll County had just supplied its teachers with a brief mimeographed elementary school course, as had also Montgomery County. About half of the counties in the state were using courses of study of a briefer form, made, as a rule, by the county superintendent or the supervisor, sometimes with the help of some of the better-trained and more experienced teachers, but more often without such assistance.

Upon the reorganization of the Maryland State Department of Education, following the enactment of the Revised School Code of 1916, the Department concerned itself, among other things, with the revision of the elementary and high school courses of study.[2] The policy was followed of encouraging each of the twenty-three counties of the state to prepare its own local courses of study.[3]

With the cordial approval of Dr. M. Bates Stephens, State Superintendent of Schools, the writer undertook in August and September, 1919, to arrange with the superintendents of schools of ten counties of Maryland to coöperate in the study under discussion. He met with unreserved encouragement throughout the entire state. Dr. Albert S. Cook, who succeeded Dr. Stephens as State Superintendent of Schools in June, 1920, with characteristic professional insight encouraged the writer to continue to carry the experiment to its logical conclusion.

Ten counties which were representative of the varied physical, economic, and educational features of the state were finally selected. These were Garrett, Allegany, Montgomery, Prince George's, Howard, Carroll, Harford, Talbot, Queen Anne's, and Wicomico. The work was begun in all these counties, but three counties were not included in the final calculations. Queen Anne's County was eliminated because of its similarity in all features to Talbot County, and because of the comprehensive testing program in which the county superintendent of schools, Mr. T. Gordon Bennett, was then engaged. Carroll and Prince George's Counties were dropped because it was found inexpedient, on account of changes in the supervisory force and other good administrative reasons, to complete the final testing of the children. Following is a brief description of the seven counties in which the work persisted.

---

[1] See *Baltimore County Course of Study*, published by Warwick & York, Inc., Baltimore.

[2] See *Annual Report*, Maryland State Board of Education, 1918, pp. 97 and 123, and similar reports for 1919, 1920, 1921, and 1922.

[3] *Annual Report*, Maryland State Board of Education, 1919, page 103.

GARRETT COUNTY[1]

Garrett County, at the extreme western end of the state, ranks among the poorest counties in wealth. It is very mountainous, and, because of lack of good roads, little has been done toward consolidation. More than three-fourths of the children are in schools having one and two teachers. Until very recently there was a lack of high schools offering a four-year course; therefore, very few pupils were prepared to enter the normal schools to prepare for teaching, and the large majority of persons teaching in the county had little more than an elementary education. As a result Garrett County was excused from having the required school session of 180 days, and the average for 1920–21 was only 156 days. The following year this average was increased to 173 days.

The expenditure per pupil is lowest in the state despite the fact that the classes are among the smallest found. One supervisor of instruction can hardly accomplish much with 187 teachers of such poor preparation scattered over 685 square miles of territory with poor roads.

The chief industries are agriculture and mining. Garrett County leads the state in the number and value of sheep raised and in the production of maple sugar. The land is best adapted for raising cattle and tree fruits.

ALLEGANY COUNTY

Except for Garrett County, which formerly was included in its boundaries, Allegany County is in the most western and mountainous part of Maryland.

Cumberland, with a population of 30,000 according to the 1920 Federal Census, the largest city in Maryland outside of Baltimore, is the county seat, and is an important center on the Baltimore and Ohio Railroad. South of New York, the best natural highway to the West is through the Narrows at Cumberland. The manufacturing industries of the county are located here. Other industries of the county are mining coal and cement rock, cattle and fruit raising, and lumbering.

---

[1] The conditions herein pictured are valid only for the time that the experiment upon which this report is based was in progress. Following the virtual reorganization of the Maryland public school system through the legislative enactments of 1922, very great improvement in school conditions has been made in every county in the state.

Because of the Normal School located at Frostburg within its boundaries and a salary schedule above the minimum established for the state, Allegany ranks second in the training and salaries of teachers. Since its population is concentrated in Cumberland, Frostburg, Westernport, and Lonaconing, and the county has started on a policy of school consolidation in the rural section at Flintstone, only 23 per cent of its pupils are in one- and two-teacher schools. This is the lowest percentage in the state. Because of city graded schools, its classes are large. Its schools have always maintained the highest percentage of attendance in the state. In value of school property back of each child enrolled, Allegany ranks highest in the state. Allegany is next to the largest county in the state, and ranks among the highest counties in wealth. It has had one supervisor for graded schools, and the assistant superintendent has given attention to the rural schools.

MONTGOMERY COUNTY

Montgomery County is located in the south-central portion of Maryland, northwest of the District of Columbia. It is bounded on the north by the Patuxent River and on the south by the Potomac River. Its industries are chiefly agricultural, and it is used for residential purposes by many whose business is carried on in Washington. It is among the wealthiest counties in the state.

About half of the pupils are enrolled in one- and two-teacher schools. This county has done more than any other county in the state in remodeling rural school buildings and equipment so that they meet the highest standards. In salary and preparation of teachers, it ranks third among the counties of the state, and in expenditure per white elementary pupil no county expends more money. Classes are below the average in size, and attendance is not so good as in the average county.

Montgomery County had one supervisor of schools, who, with the county superintendent, was active in building up the interest of patrons in the schools and in securing their support of educational policies.

HOWARD COUNTY

Howard County, small in area, is located west of the southern part of Baltimore County. It is bounded on the north by the Patapsco River and on the south by the Patuxent River. Its county seat is at Ellicott City, which has flour and cotton mills and granite quarries. Agriculture is the chief industry in the county.

Although it is one of the wealthiest counties in the state, Howard County has not been generous in the support of the schools, having one of the lowest school tax rates in the state. It has had no supervision of instruction other than that given incidentally by the superintendent and the attendance officer.

It ranks below the average in salaries and preparation of teachers. Since it pays only the minimum, and is in close proximity to Baltimore City and County and Montgomery County, which pay higher salaries, it has a high turnover. It ranks below the median county in expenditure per pupil. Nearly 60 per cent of the pupils are in one- and two-teacher schools. In per cent of attendance it ranks among the five lowest counties in the state. It ranks high in having a long school year.

HARFORD COUNTY

Harford County is in the northeastern part of Maryland, its eastern boundary being the Susquehanna River. Its chief industries are agriculture and fishing. In the training and average salary of its teaching staff it ranks somewhat above the median county. In expenditure for current expense per elementary pupil it is a median county. Its school session was longer than in any other county of Maryland, but in per cent of attendance it ranks below the average county. Nearly two-thirds of the pupils are in one- and two-teacher schools. The graded schools are found at Havre de Grace, Aberdeen, and Bel Air, the county seat. It has one supervisor of elementary schools who devotes most of her time to the improvement of instruction in the rural schools.

TALBOT COUNTY

Talbot County is one of the smaller counties bordering the central part of the Eastern Shore of the Chesapeake Bay. Fishing, crabbing, oystering, sheep raising, and wheat and corn growing are its chief industries. It has a well-trained teaching staff and a high per cent of attendance. It ranks with the median Maryland County in the salaries of teachers and expenditure per pupil attending. One supervisor aided the superintendent in the improvement of instruction. Not quite one-half of the children attended one- and two-room schools.

Easton, the county seat, has important oyster and canning interests and does considerable manufacturing.

WICOMICO COUNTY

Wicomico County is on the Eastern Shore of Maryland bordering the western part of the southern boundary of Delaware. It is bounded on the east by the Pocomoke River and on the west by the Nanticoke River. Salisbury, a thriving city of 7,000 inhabitants, is the county seat. Although in the preparation and salaries of its teachers it ranks below the median county and because of large classes it ranks seventh from the bottom in expenditure per pupil, in per cent of attendance of pupils it ranks among the highest counties in the state. Of the total enrollment, an average of 80.6 per cent were in attendance daily. It ranks below the median county in wealth back of each child. Wicomico has had the services of two supervisors for a long period, one being assigned wholly to rural schools. The school buildings are in good repair and are well equipped. It has been difficult to win approval of the voters of the county to an issue of bonds for building new schools, which the county needs greatly, especially in Salisbury.

The industries of Wicomico are chiefly the production of vegetables and berries, fishing, crabbing, and oystering. There is manufactured in Salisbury a variety of lumber products, especially boxes and baskets for shipping fruits and vegetables.

Some of the significant educational features of the seven cooperating counties are presented in Table 1.

MEASURING GROWTH OF PUPILS

For purposes of comparison, two methods were used in measuring the growth of the pupils:

1. The children were tested in selected school subjects in the fall and in the spring. On the basis of the test results the schools were ranked in the spring from 1 to 40 (assuming 40 teachers in the curriculum-making group) according to the contributions made to the course of study in each of the subjects in which the children

TABLE 1

VARIOUS EDUCATIONAL FEATURES IN WHITE ELEMENTARY SCHOOLS OF THE SEVEN COÖPERATING COUNTIES

AREA, POPULATION, ENROLLMENT, AND ATTENDANCE

County	Area in Sq. Miles	Total White Population, 1920	Enrollment	Per Cent Enrollment in Average Attendance	Average Days in Session	Per Cent of Pupils in One- and Two-Teacher Schools	Attendance per Teacher
Allegany	443	68,111	10998	84.7(1)	179.6(16)	23.2(1)	31.4(2)
Montgomery	521	26,633	4367	73.6(14)	180.1(15)	48.4(11)	25.1(14)
Talbot	268	12,138	2135	79.9(4)	179.1(18)	45.6(7)	27.5(7)
Harford	442	24,687	4398	72.7(15)	195.6(1)	63.0(17)	26.2(10)
Wicomico	371	21,754	4026	80.6(3)	179.6(16)	46.7(10)	28.2(5)
Howard	250	12,316	2354	70.8(19)	191.5(2)	59.5(16)	26.1(11)
Garrett	685	19,629	5343	72.5(16)	172.7(22)	75.5(20)	20.7(21)
Average of 23 Counties	430	25,200	4725	75.8	182.2	48.3	27.0

NUMBER OF ELEMENTARY TEACHERS AND SUPERVISORS, CERTIFICATION SCORES AND SALARIES OF TEACHERS, AND PER-PUPIL EXPENDITURES

County	No. of Elementary Teachers	No. of Supervisors	Certification Score of Elementary Teachers*	Average Salary per Teacher	Current Expenditures† per White Elementary Pupil		Remarks
					Enrolled	Attending	
Allegany	296	2‡	84(2)	$1,218(2)	$38(4)	$47(7)	Mountainous
Montgomery	128	1	80(3)	1,070(3)	41(2)	60(1)	Near Washington
Talbot	62	1	75(4)	827(12)	31(8)	39(12)	Eastern Shore
Harford	122	1	63(7)	858(9)	28(12)	40(11)	
Wicomico	115	2	54(13)	805(14)	26(17)	36(17)	Eastern Shore
Howard	64	0	50(15)	824(13)	27(14)	38(13)	Near Baltimore
Garrett	187	1	24(23)	574(23)	22(22)	32(23)	Extreme west, mountainous
Average of 23 Counties	133	..	61	$937	$34	$43	

The numbers in parentheses indicate the rank of the county among the 23 counties of the state in respect to the item specified in the column heading.

* Weighting: 1st grade regular 4; 1st grade provisional 2; 2nd grade regular 2; 2nd grade provisional 1; 3rd grade regular 1; 3rd grade provisional 1.

† Excluding general control, fixed charges, and capital outlay.

‡ One of these is an assistant superintendent who supervises rural schools.

NOTE: The reader should keep in mind the fact that the county ranks herein reported were true only at the time this investigation was made. The remarkable progress of the Maryland public school system since 1920 has brought about an annual shifting of county standings.

were tested. The correlation was determined between the contribution by the teacher and the progress of the pupils. This plan was to apply to four of the original ten counties. Two of these counties, Carroll and Prince George's, dropped out of the investigation, as already explained (p. 6), thus limiting this phase of the experiment to Talbot and Montgomery Counties. For reasons stated later in this report, the final tests were not given in these two counties. Although teachers in a supervisory group of each county entered upon the experiment and produced several courses of study, some of them possessing merit of a high order, the original plan of ranking the teachers in the order of excellence of the curriculum work done by each was not carried out. Instead, the opportunity presented itself of testing the possibility of producing in each county, Talbot and Montgomery, a course of study for a particular school. A full account of the progress and the result of the experiment in these two counties was prepared, but limitations of space forbid its publication in this report.

2. The familiar equivalent-groups method was employed whereby two groups, as nearly equivalent as it was possible to secure them, were used. The teachers working on courses of study constituted the experimental group, and the other group was kept as nearly in ignorance as possible of the special work undertaken by the experimental group. The experimental group, under the direction and with the assistance of the supervisor, engaged in curriculum making as the chief activity for the year, while the supervisor, in her work with the control group, gave no attention to the formulation of courses of study but otherwise followed the normal supervisory procedure planned for that year. This method was to be used in six of the ten counties, including the five which are reported in this discussion. It will be shown in the next chapter that the experimental groups were almost exactly equivalent to the control groups.

CHAPTER III

THE EQUIVALENCE OF GROUPS WITHIN A COUNTY

In each of the five counties which persisted in the experiment herein reported, Garrett, Allegany, Howard, Harford, and Wicomico, arrangements were made with the county superintendent of schools and the elementary school supervisors to conduct an experiment in curriculum making by the equivalent-groups method. The teachers under supervision were divided into two groups as nearly equal in training, experience, personality, executive ability, and teaching power as the supervisory officials were able to determine. One group in each county was known as the experimental group. For the teachers of each of these groups it was arranged with the county superintendent that the only means of supervision to be employed for the entire year should be curriculum making. All their growth in professional knowledge, all their improvement in classroom instruction, was to come, if at all, through their participation in this professional project, with the collateral readings, investigations, reports, and discussions in subcommittees and before the entire group, which were necessitated by active and intelligent consideration of the many stimulating problems proposed in the beginning, and which arose in increasing numbers as the experiment progressed.

Another group in each county constituted the control group. The teachers of each of the control groups were to give no attention to the formulation of a curriculum, but were to have all the benefit possible of such other means of supervision — teachers' meetings, conferences with individual teachers, visiting schools in and out of the system, observation lessons and critiques, age-grade studies and standards for promotion, standard tests and measurements, printed and mimeographed helps, etc., as should be deemed desirable in each county.

The county superintendent and his professional assistants agreed to make the two groups as nearly equivalent as conditions would permit, taking into account the factors which are discussed on the following pages.

1. *Types of Schools.* — If the schools are classified as one-teacher schools, two-teacher schools, and schools of three or more teachers, it is found that the so-called rural schools, those with one or two teachers, predominate in each group. Table 2 exhibits the percentage of each of these three types of schools that were placed in the experimental group and the control group of each of the five counties wherein the experiment was conducted by the equivalent-groups method.

TABLE 2

PERCENTAGE OF EACH OF THREE DIFFERENT TYPES OF SCHOOLS IN THE EXPERIMENTAL AND CONTROL GROUPS IN FIVE COUNTIES

County	EXPERIMENTAL GROUP			CONTROL GROUP		
	1 Teacher	2 Teachers	3 Teachers or more	1 Teacher	2 Teachers	3 Teachers or more
Garrett	36	36	28	30	50	20
Allegany	100	..	..	100	..	..
Howard	67	7	26	80	20	..
Harford	33	67	..	86	..	14
Wicomico	100	..	..	82	18	..

An examination of the data presented in Table 2 shows that in Garrett, Allegany, Harford, and Wicomico counties the two groups were approximately equivalent as to the kinds of schools in which the teachers were located. In Howard County one-fourth of the teachers of the experimental group were in the larger graded schools, whereas no teachers of similar schools worked in the control group. This may have given an advantage to the experimental group, but it was not measurable by the methods pursued in this study.

2. *Certification of Teachers.* — As an additional measure of the equivalence of the two groups, the author consulted the records of all the teachers participating in this study, these records being on file in the Bureau of Certification of the State Department of Education. Table 3 represents the amount of training beyond the elementary school which the teachers of the five counties enjoyed at the beginning of the experiment.

It may be noted that Wicomico County showed the greatest difference in favor of the experimental group. In this county, this fact was not known at the time the groups were selected. In so far as empirical judgment permitted, the county supervisor endeavored to form two groups that were very much alike, with no advantage to either. At the same time, she gave consideration to convenience of assembling, and the possibility of regularity in attending meetings.

TABLE 3

TRAINING OF TEACHERS IN YEARS BEYOND THE ELEMENTARY SCHOOL AT BEGINNING OF EXPERIMENT

County	Experimental Group Average	Control Group Average	Difference
Garrett	3.81	3.29	.52
Allegany	5.16	4.85	.31
Howard	4.18	4.16	.02
Harford	4.17	4.15	.02
Wicomico	4.94	4.17	.77
Average	4.45	4.12	.33

In Garrett County, the teachers of the experimental group had one-half year more training than those of the control group. The mountainous character of this county, the many impassable roads for a large part of the school year, and the long distances that many teachers have to travel to attend teachers' meetings made it necessary to place in the experimental group teachers who would be reasonably sure of being present at the meetings where course-of-study making was under consideration. The factor of training was not checked up, and the supervisor was not aware, at the time the groups were organized, that the teachers of the experimental group were slightly better trained than those of the control group.

In Allegany County, the difference was still less; and in Howard and Harford Counties, it was negligible.

For the five counties combined, the teachers of the experimental group had an average training of one-third of a year more than those of the control group. The median training of the teachers of the five counties in the experimental group at the beginning of the experiment was 4.43 years beyond the elementary school; while the median for those of the control group was 4.29 years — a

S. H. S. T. C. LIBRARY

difference in favor of the experimental group of .14 of a year, which is still less than the average difference.

3. *Rating by Superintendent.* — A county superintendent of schools in Maryland is required by law to rate (classify) all the teachers in his county. In doing so he must consider (*a*) scholarship, (*b*) executive ability, (*c*) personality, (*d*) teaching power. The county superintendent may add such other requirements as are approved by the state superintendent of schools.

> The county superintendent shall keep a record of the kind, grade, and class of certificate held by each teacher employed in the county, and on or before the first day of October of each year, he shall submit to the county board of education a list of all the teachers employed, together with the kind, grade, and class of their certificates, and a copy of this report shall be transmitted to the State Superintendent of Schools.[1]

As the teacher's salary depends upon her rating as first class or second class, the rating is, as a rule, very carefully done. The superintendent of each county included in this study understood the importance of having the experimental group as nearly equivalent to the control group as possible. He therefore saw to it that, within the limits of his judgment, there was the same percentage of first-class and second-class teachers in each group.

4. *Social and Economic Status of the Communities.* — Within a particular county there was no apparent difference in the social and economic status of the patrons of the schools in the two groups. There were differences, it is true, between the counties, as shown in the preceding chapter, but this study does not compare one county with another. Where comparisons occur, they are made between schools within a certain county.

In none of the five counties were the schools constituting the experimental group limited to a definite geographical section; in most cases there was considerable overlapping of the areas within which the schools of each group were located. Each group, therefore, represented a fairly complete cross-section of the entire county. If any differences in social life, vocational pursuits, commercial activities, or other habits and customs of the people existed within a county they were slight, and, so far as could be determined, these factors were practically identical in the two groups.

5. *Length of School Term, Salaries Paid to Teachers, Per-Capita Wealth Back of Each Child.* — These factors assume no importance

---

[1] Maryland Public School Laws, 1927, Chap. 8, Section 88.

in this study, for the reason that under the Maryland county-unit plan of school administration they are uniform throughout the county. Salaries, it is true, were not identical in all the schools of the two groups; but salaries depended upon the training of the teachers and the superintendent's rating. The effect of these elements upon the equivalence of the groups has been considered elsewhere in this report.

CHAPTER IV

STATISTICAL DATA OF THE EXPERIMENT PERTAINING TO PUPILS

FUNCTIONS TESTED

In order to determine the effect which teacher participation in curriculum making would have upon pupil progress in the common school subjects, it was necessary to measure the achievement of children affected by the experiment. Accordingly, standardized tests were given in such of the common school subjects as were generally agreed to be a necessary and important part of elementary school curricula. In other words, if anything were done to retard the progress of children in these subjects, marked dissatisfaction would result on the part of both school people and the public generally. The children were tested in the following functions:

Speed in Reading — Number of words per minute.
Index of Comprehension of reading.
Spelling — Percentage of words correctly spelled.
Language — Score in language ability made in given time.
Written Composition — Quality of work.
Written Composition — Number of words written in given time.
Arithmetic — Score in fundamental operations made in given time.

TESTS AND SCALES USED

The following tests and scales were used in both the initial and final tests:

Reading — Courtis' Standard Research Test, Silent Reading No. 2.

Spelling — Modified Ayres Spelling Test, ten words each from Columns L, O, Q, S, U, W; total 60 words.

Language — Trabue's Language Scale B.

Composition, Quality. The test was administered according to directions given in Willing's Scale for measuring written composition. Scored by Trabue's Nassau County Supplement to the Hillegas Scale.

Arithmetic — Woody-McCall's Mixed Fundamentals, Form 1.

WHEN THE TESTS WERE GIVEN

The initial tests were given between September 15 and October 15. In Montgomery, Talbot, and Wicomico Counties they were given in the fall of 1919; and in Garrett, Allegany, Howard, and Harford Counties, in the fall of 1920. Tests in composition were not given in Harford County.

In the five counties using equivalent groups the final tests were given between April 15 and May 15, 1920, and as nearly as possible in the same order in which the initial tests were given.

Initial tests were given in the fall of 1919 in Carroll, Prince George's and Queen Anne's Counties. Since these counties dropped out of the study, for reasons already explained (p. 6), the final tests were omitted.

ADMINISTERING OF TESTS

The following persons administered all tests, care being taken that the same person should test the same school in both the initial and the final tests:

Garrett County: Mr. F. E. Rathbun, County Superintendent; Miss Edna M. Marshall, County Supervisor.

Allegany County: Mr. John J. Tipton, Assistant Superintendent in charge of rural schools; Mr. Thos. H. Morgan, Attendance Officer.

Howard County: Mr. Woodland C. Phillips, County Superintendent; Mrs. S. E. M. Poisal, Attendance Officer and Helping Teacher.

Harford County: Mr. C. Milton Wright, County Superintendent; Miss Jane Naylor, County Supervisor.

Wicomico County: Mr. James M. Bennett, County Superintendent; Miss C. Nettie Holloway, Supervisor of Rural Schools; Miss L. Cora Gilliss, Helping Teacher; Mr. Charles E. Tilghman, Attendance Officer.

Montgomery County: Mr. Edwin W. Broome, County Superintendent; Miss Nettie E. Brogden, County Supervisor.

Talbot County: Mr. Nicholas Orem, County Superintendent; Miss Frances H. Clark, County Supervisor.

Before the testing was begun, the writer visited each of the counties and conferred with the persons who were to give the tests, explaining fully the method of administering them. These persons practiced giving the tests before beginning the field work. Such precautions, it is believed, brought about approximate uniformity of method.

SCORING OF TESTS

The papers of the initial tests given the first year (1919) were collected by the writer, and those of two counties were scored under his direction and supervision at his office in Baltimore. It was found that the labor of scoring the tests of all the counties in this manner would be enormous, and arrangements were made that all succeeding tests should be scored at the county seat under the direction of the persons who gave the test. The writer kept in close touch with the procedure and carefully checked it up, and feels that the reliability of results was not affected adversely by this procedure.

All the papers in English composition were scored by Miss Mary E. Holloway, Supervisor of Rural Schools of Queen Anne's County. She constantly endeavored to score fairly and accurately the samples submitted by the children. She memorized the scale and reviewed it frequently. Precautions were taken to avoid any possibility of mental bias on her part. The two sets of initial and final test papers were distributed more or less equally and were not scored in sequence, either in respect to pupils' grades or the time of giving the tests.

In order to determine Miss Holloway's reliability as a scorer of English composition by young people, two hundred samples of compositions collected in this test were judged by Miss Holloway and seven other specialists in English.

One hundred of these papers formed a part of the initial tests and one hundred were taken from the papers of the final tests. They were scored by number, all other identification marks being removed. None of the judges knew when the tests were given. The seven judges, in addition to Miss Holloway, included a high school teacher of history, two normal school teachers of English and history, one normal school teacher of English, one specialist in English and music, one specialist in English and geography, and a college graduate whose major interest was English. Two sets of samples were handed to these judges, with the following directions:

> This envelope contains one hundred samples of English composition by young people, numbered 1 to 100 (and 101 to 200). Please score each sample by Trabue's Nassau County Supplement to the Hillegas Scale, and record each score on the blank herewith enclosed opposite the number corresponding with the number of the sample. Make no marks on the samples.

The scores reported by the eight judges were tabulated, the median score for each sample derived, and Miss Holloway's deviation from each median was determined. The median of these deviations was found to be slightly under one-tenth. Out of the total of two hundred scores, Miss Holloway's judgment did not deviate from the median judgment of the eight judges in 137 cases. The writer feels, therefore, that Miss Holloway's scorings of the samples in composition were sufficiently accurate for the purposes of this experiment.

PRESENTATION OF THE DATA

The statistical data are presented in four different groups of tables. The first group includes Tables 4 to 8. These tables show the number of children tested in each grade of each group in the five counties. The maximum number, the minimum number, and the average number of children tested in each grade are given for each county. The number of children tested is not uniform for the seven functions. This was caused by transfers from school to school during the year, and changes in the personnel of a particular school between the initial and the final test. All children were included in the final report who, upon completion of the final tabulation, were found to have been present for both tests. The small number of cases reported for the quality of composition in Wicomico County is due to the fact that one set of papers was lost in transit from Miss Holloway's office to the writer's.

The second group includes Tables 9 to 13. These tables show comparisons for the several counties between experimental and control groups. All children in the experimental group for a particular county are compared with all children in the control group in the amount of improvement which was made in each function. The results are given for Grades 3 to 7 combined. Separate entries were made for the respective grades, but calculations for separate grades in each county would have involved needless expenditure of time and labor.

The third group contains Tables 14 to 20. These tables present in a different form the same data as appear in the second group. These enable the reader to ascertain the improvement made by each group in each of the functions tested for any one or all of the five counties.

The fourth group presents Tables 23 to 27. To secure the data presented in these tables, all the children tested in the state were grouped separately by grades and the results calculated for each of four functions. The reader may ascertain from these tables the general effect upon children, in each grade separately, of the experiment reported in this discussion.

Table 21 is a summary showing the differences between the improvement means of the experimental groups and the control groups, and Table 22 is a similar summary showing the experimental coefficients in all the functions tested for all five counties.

A study of these tables will reveal a number of interesting facts:

1. There were 925 different children tested in the experimental groups, and 869 in the control groups, a total of 1,794 in the five counties. (Tables 4 to 8)

2. The experimental group did, on the whole, as good work during the period of the investigation as was done by the control group. Nineteen differences out of a total of 33 between improvement scores favor the experimental group. (Table 21)

Only five, or at most seven, of these differences are really significant, as will be hereinafter explained. (See note following Table 9, and discussion following Table 27.)

3. Out of a total of 89.35 points of difference, 45.48 favor the experimental group and 43.87 favor the control group. (Table 21)

4. Out of a total of 12.90 experimental coefficient points, 7.05 favor the experimental groups and 5.85 favor the control groups. (Table 22)[1]

5. The control group was superior in reading speed in three of the five counties and in index of comprehension of reading in four counties of the five. (Table 22)

6. In spelling, the experimental group was decidedly superior in four out of five counties. (Table 22)

7. In arithmetic, the experimental group was slightly superior in three of the five counties, but the total differences were larger

---

[1] For a discussion of experimental coefficients see W. A. McCall's *How to Measure in Education*, pp. 404, 405.

in the two counties in which the control group were favored than in the three counties in which the experimental group was superior. (Table 22)

8. In language, the experimental group was superior in all five counties. (Table 22)

9. In composition, the honors are equally divided, the control groups and the experimental groups being superior in each of two counties, tests in this subject not being given in Harford County. (Table 22)

TABLE 4

Number of Children Tested in Each Grade in Garrett County

Test	Experimental Group						Control Group					
	Grade					Total	Grade					Tota
	3	4	5	6	7		3	4	5	6	7	
1. Reading, Speed.........	58	58	75	46	47	284	80	88	44	50	22	284
2. Reading, Comprehension	57	57	77	45	48	284	84	92	46	47	24	293
3. Spelling...............	59	58	79	44	48	288	73	80	43	43	17	256
4. Arithmetic.............	60	56	78	45	48	287	85	92	47	51	23	298
5. Language...............	60	57	79	45	47	288	72	80	42	44	19	257
6. Composition, Quality....	44	51	76	43	48	262	58	66	26	38	11	199
7. Composition, Speed.....	43	51	77	43	47	261	55	67	27	37	11	197
Maximum number......	60	58	79	46	48	288	85	92	47	51	24	298
Minimum number......	43	51	75	43	47	261	55	66	26	37	11	197
Average...............	55	55	77	44	48	279	73	81	39	44	18	255

TABLE 5

Number of Children Tested in Each Grade in Allegany County

Test	Experimental Group						Control Group					
	Grade					Total	Grade					Total
	3	4	5	6	7		3	4	5	6	7	
1. Reading, Speed.........	19	21	40	23	9	112	21	26	25	24	21	117
2. Reading, Comprehension	20	21	38	21	10	110	20	24	23	24	22	113
3. Spelling...............	15	24	38	18	8	103	18	31	27	23	24	123
4. Arithmetic.............	16	23	35	19	10	103	14	27	21	22	23	107
5. Language...............	20	23	44	23	10	120	19	30	26	20	24	119
6. Composition, Quality....	16	22	33	20	12	103	18	28	28	24	23	121
7. Composition, Speed.....	16	22	34	20	12	104	19	26	27	23	23	118
Maximum number......	20	24	44	23	12	120	21	31	28	24	24	123
Minimum number......	15	21	33	18	8	103	14	24	21	20	21	107
Average...............	18	22	37	21	10	108	19	27	25	23	23	117

TABLE 6

NUMBER OF CHILDREN TESTED IN EACH GRADE IN HOWARD COUNTY

Test	EXPERIMENTAL GROUP						CONTROL GROUP					
	Grade					Total	Grade					Total
	3	4	5	6	7		3	4	5	6	7	
1. Reading, Speed.........	33	34	40	29	23	159	61	41	53	51	31	237
2. Reading, Comprehension	34	36	46	31	24	171	56	42	55	50	31	234
3. Spelling...............	39	34	40	28	16	157	72	41	53	48	32	246
4. Arithmetic.............	34	36	39	25	21	155	76	41	56	49	32	254
5. Language..............	45	37	42	33	26	183	79	42	53	52	30	256
6. Composition, Quality....	46	37	43	30	25	181	84	42	57	47	33	263
7. Composition, Speed.....	45	38	44	32	28	187	81	45	57	50	32	265
Maximum number......	46	38	46	32	28	187	84	45	57	51	33	265
Minimum number......	33	34	39	25	16	155	56	41	53	47	30	234
Average...............	39	36	42	30	23	170	73	42	55	49	32	251

TABLE 7

NUMBER OF CHILDREN TESTED IN EACH GRADE IN HARFORD COUNTY

Test	EXPERIMENTAL GROUP						CONTROL GROUP					
	Grade					Total	Grade					Total
	3	4	5	6	7		3	4	5	6	7	
1. Reading, Speed.........	32	50	32	29	11	154	9	33	20	19	9	90
2. Reading, Comprehension	32	52	37	26	11	158	10	35	20	20	9	94
3. Spelling...............	33	52	34	29	11	159	11	35	20	19	9	94
4. Arithmetic.............	33	52	34	29	11	159	10	35	20	19	9	93
5. Language..............	32	51	34	29	11	157	10	35	20	19	9	93
6. Composition, Quality....	Tests not given											
7. Composition, Speed.....	Tests not given											
Maximum number......	33	52	37	29	11	159	11	35	20	20	9	94
Minimum number.......	32	50	32	26	11	154	9	33	20	19	9	90
Average...............	32	51	34	28	11	157	10	34	20	19	9	92

TABLE 8

NUMBER OF CHILDREN TESTED IN EACH GRADE IN WICOMICO COUNTY

Test	EXPERIMENTAL GROUP						CONTROL GROUP					
	Grade					Total	Grade					Total
	3	4	5	6	7		3	4	5	6	7	
1. Reading, Speed	31	43	41	29	5	149	21	26	15	9	4	75
2. Reading, Comprehension	33	46	43	28	6	155	20	26	14	9	4	73
3. Spelling	38	44	48	30	6	166	22	29	19	11	4	85
4. Arithmetic	37	45	48	31	5	166	14	26	18	10	4	72
5. Language	39	45	47	31	6	168	25	30	19	11	4	89
6. Composition, Quality	25	21	26	15	10	97	11	14	11	4	5	45
7. Composition, Speed	44	44	44	28	11	171	23	30	19	11	5	88
Maximum number	44	46	48	31	11	171	25	30	19	11	5	89
Minimum number	25	21	26	15	5	97	11	14	11	4	4	45
Average	35	41	42	27	8	153	19	26	16	9	4.5	75

TABLE 9

RESULTS IN ALL FUNCTIONS FOR GARRETT COUNTY IN GRADES 3 TO 7 COMBINED

Test	EXPERIMENTAL GROUP			CONTROL GROUP			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
1. Reading, Speed	284	31.20	2.85	284	51.40	2.89	−20.20	4.05	−1.79
2. Reading, Comprehension	284	11.40	1.57	283	14.08	1.67	− 2.68	2.25	− .43
3. Spelling	288	8.36	.33	256	7.62	.37	.74	.49	.53
4. Arithmetic	287	4.79	.22	298	4.77	.21	.02	.30	.02
5. Language	288	2.39	.16	257	2.35	.17	.04	.23	.06
6. Composition, Quality	262	.48	.06	199	.53	.06	− .05	.08	− .21
7. Composition, Speed	261	2.00	3.65	197	3.50	3.69	1.50	5.19	.10

Four differences favor the experimental group and three favor the control group.

Out of a total of 3.14 experimental coefficient points, .71 favor the experimental group, and 2.43 favor the control group.

In Table 9 and the following tables, to and including Table 20, both the sigma (standard deviation) of the difference between the improvement averages, and the experimental coefficient are given. Either may be employed as a measure of the unreliability of the obtained differences which appear in the tables. (See McCall: *How to Measure in Education* pp. 398ff., for a discussion of reliability measures.)

In order to be practically certain that each difference herein reported is reliable, or a true difference, *i.e.*, would hold good if tests had been given to all the children in the respective grades in each county, of which those actually tested were an attempted random sampling, adding to or subtracting from the obtained difference three times the sigma difference should not change the algebraic sign of the difference. For example, take the first difference given in Table 9, −20.20 with a sigma difference of 4.05. This shows that in reading speed the experiment favored the control group. There is practical certainty that the true difference between the two improvement averages is −20.20 ± 3 (4.05), *i.e.*, between −8.05 and −32.35. It is safe to conclude that the control group actually did have the advantage in respect to this one function.

Similarly, take spelling with an obtained difference of + .74 and a sigma difference of .49. The true difference will lie between the limits + .74 ± 3 (.49), *i.e.*, between + 2.21 and −.73. A difference less than zero would indicate that the experiment favored the control group rather than the experimental group. If practical certainty is not demanded, the chances are very great (21 to 1) that the true difference is between the obtained difference, as given, ± 2 S.D. difference. The chances are substantial (2.15 to 1) that the true difference is between the obtained difference ± 1 S.D. difference.

The unreliability of the difference may be readily seen by noting the experimental coefficient (last column of each table) in the case of each function. A positive sign indicates that the experiment favored the experimental group; a coefficient less than zero shows that the control group had the advantage. The experimental coefficient shows the degree of certainty that the difference is reliable, 1.0 being practical certainty, and the certainty increasing or diminishing as the coefficient (regardless of sign) goes above or below unity.

TABLE 10

RESULTS IN ALL FUNCTIONS FOR ALLEGANY COUNTY IN GRADES 3 TO 7 COMBINED

Test	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
1. Reading, Speed.....	112	27.25	4.87	117	32.25	4.20	− 5.00	6.43	− .28
2. Reading, Comprehension..........	110	8.30	5.44	113	14.40	4.06	− 6.10	6.77	− .32
3. Spelling............	103	10.48	.84	123	9.04	.89	1.44	1.22	.44
4. Arithmetic.........	103	6.34	.59	107	6.71	.53	− .37	.79	− .17
5. Language..........	120	2.90	.33	119	2.78	.34	.12	.47	.09
6. Composition, Quality	103	.59	.09	121	.50	.09	.09	.13	.25
7. Composition, Speed.	104	4.33	6.29	118	5.00	5.50	− .67	8.36	− .03

Three differences favor the experimental group, and four favor the control group.

Out of a total of 1.58 experimental coefficient points .78 favor the experimental group and .80 favor the control group.

TABLE 11

Results in All Functions for Howard County in Grades 3 to 7 Combined

Test	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
1. Reading, Speed.....	159	24.00	3.16	237	26.40	2.27	−2.40	3.89	−.22
2. Reading, Comprehension..........	171	8.10	1.84	234	9.40	1.88	−1.30	2.63	−.18
3. Spelling............	157	10.64	.59	246	10.76	.43	− .12	.73	−.06
4. Arithmetic.........	155	5.63	.31	254	5.42	.26	.21	.40	.19
5. Language..........	183	2.46	.18	256	1.79	.17	.67	.25	.98
6. Composition, Quality	181	.10	.07	263	.05	.06	.05	.10	.18
7. Composition, Speed.	187	3.20	2.85	265	3.80	2.64	7.00	3.88	.65

Four differences favor the experimental group and three favor the control group.

Out of a total of 2.46 experimental coefficient points, 2.00 favor the experimental group and 46 favor the control group.

TABLE 12

Results in All Functions for Harford County in Grades 3 to 7 Combined

Test	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
1. Reading, Speed.....	154	38.20	3.30	90	30.80	3.24	7.40	4.63	.57
2. Reading, Comprehension..........	158	17.00	2.72	94	9.70	3.13	7.30	4.15	.63
3. Spelling............	159	8.71	.44	94	8.05	.50	.66	.67	.35
4. Arithmetic.........	159	4.85	.26	93	4.64	.36	.21	.44	.17
5. Language..........	157	2.55	.21	93	2.44	.28	.11	.35	.11
6. Composition, Quality	No tests given								
7. Composition, Speed.	No tests given								

Out of five differences shown, five favor the experimental group.

Out of a total of 1.83 experimental coefficient points, 1.83 favor the experimental group.

TABLE 13

RESULTS IN ALL FUNCTIONS FOR WICOMICO COUNTY IN GRADES 3 TO 7 COMBINED

Test	EXPERIMENTAL GROUP			CONTROL GROUP			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
1. Reading, Speed	149	42.60	4.04	75	26.00	4.44	16.60	5.99	.99
2. Reading, Comprehension	155	10.60	3.05	73	12.95	4.29	−2.35	5.26	− .16
3. Spelling	166	11.31	.48	85	10.58	.87	.73	.99	.22
4. Arithmetic	166	6.87	.33	72	7.34	.48	− .47	.58	− .29
5. Language	168	2.78	.20	89	2.19	.35	.59	.40	.52
6. Composition, Quality *	97	.53	.11	45	1.09	.06	− .56	.13	−1.60
7. Composition, Speed	171	24.60	1.13	88	26.20	5.34	−1.60	5.45	− .11

* Composition papers of several schools were lost after score for speed was recorded and before the score for quality was determined.

Three differences favor the experimental group, and four favor the control group.

Out of a total of 3.89 experimental coefficient points, 1.73 favor the experimental group, and 2.16 favor the control group.

TABLE 14

RESULTS IN SPEED OF READING FOR EACH COUNTY IN GRADES 3 TO 7 COMBINED

County	EXPERIMENTAL GROUP			CONTROL GROUP			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett	284	31.20	2.85	284	51.40	2.89	−20.20	4.05	−1.79
Allegany	112	27.25	4.87	117	32.25	4.20	− 5.00	6.43	− .28
Howard	159	24.00	3.16	237	26.40	2.27	− 2.40	3.89	− .22
Harford	154	38.20	3.30	90	30.80	3.24	7.40	4.63	.57
Wicomico	149	42.60	4.04	75	26.00	4.44	16.60	5.99	.99

TABLE 15

Results in Comprehension in Reading for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett....	284	11.40	1.51	293	14.08	1.67	−2.68	2.25	−.43
Allegany...	110	8.30	5.44	113	14.40	4.06	−6.10	6.77	−.32
Howard....	171	8.10	1.84	234	9.40	1.88	−1.30	2.63	−.18
Harford....	158	17.00	2.72	94	9.70	3.13	7.30	4.15	.63
Wicomico...	155	10.60	3.05	73	12.95	4.29	−2.35	5.26	−.16

TABLE 16

Results in Spelling for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett....	288	8.36	.33	256	7.62	.37	.74	.49	.53
Allegany...	103	10.48	.84	123	9.04	.89	1.44	1.22	.44
Howard....	157	10.64	.59	246	10.76	.43	−.12	.73	−.06
Harford....	159	8.71	.44	94	8.05	.50	.66	.67	.35
Wicomico...	166	11.31	.48	85	10.58	.87	.73	.99	.22

TABLE 17

Results in Arithmetic for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett.....	287	4.79	.22	298	4.77	.21	.02	.30	.02
Allegany...	103	6.34	.59	107	6.71	.53	−.37	.79	−.17
Howard....	155	5.63	.31	254	5.42	.26	.21	.40	.19
Harford....	159	4.85	.26	93	4.64	.36	.21	.44	.17
Wicomico...	166	6.87	.33	72	7.34	.48	−.47	.58	−.29

TABLE 18

Results in Language for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett....	288	2.39	.16	257	2.35	.17	.04	.23	.06
Allegany...	120	2.90	.33	119	2.78	.34	.12	.47	.09
Howard....	183	2.46	.18	256	1.79	.17	.67	.25	.98
Harford....	157	2.55	.31	93	2.44	.28	.11	.35	.11
Wicomico...	168	2.78	.20	89	2.19	.35	.59	.40	.52

TABLE 19

Results in Composition Quality for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett....	262	.48	.06	199	.53	.06	−.05	.08	−.21
Allegany...	103	.59	.09	121	.50	.09	.09	.13	.25
Howard....	181	.10	.07	263	.05	.06	.05	.10	.18
Harford....	No tests given								
Wicomico...	97	.53	.11	45	1.09	.06	−.56	.13	−1.60

TABLE 20

Results in Composition Speed for Each County in Grades 3 to 7 Combined

County	Experimental Group			Control Group			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Garrett....	261	−2.00	3.65	197	−3.50	3.69	1.50	5.19	.10
Allegany...	104	4.33	6.29	118	5.00	5.50	−.67	8.36	−.03
Howard....	187	3.20	2.85	265	−3.80	2.64	7.00	3.88	.65
Harford....	No tests given								
Wicomico...	171	24.60	1.13	88	26.20	5.34	−1.60	5.45	−.12

TABLE 21

SUMMARY OF THE DIFFERENCES BETWEEN AVERAGE IMPROVEMENT OF THE EXPERIMENTAL GROUPS AND AVERAGE IMPROVEMENT OF THE CONTROL GROUPS IN ALL FUNCTIONS, GRADES 3 TO 7 COMBINED, IN ALL COUNTIES

Test	COUNTY					NO. OF DIFFERENCES FAVORING		TOTAL DIFFERENCES FAVORING	
	Garrett	Allegany	Howard	Harford	Wicomico	Exp. Group	Control Group	Exp. Group	Control Group
Reading, Speed	−20.20	−5.00	−2.40	7.40	16.60	2	3	24.00	27.60
Reading, Comprehension	−2.68	−6.10	−1.30	7.30	−2.35	1	4	7.30	12.43
Spelling	.74	1.44	−.12	.66	.73	4	1	3.57	.12
Arithmetic	.02	−.37	.21	.21	−.47	3	2	.44	.84
Language	.04	.12	.67	.11	.59	5	..	1.53	..
Composition, Quality	−.05	.09	.05	..	−.56	2	2	.14	.61
Composition, Speed	1.50	−.67	7.00	..	−1.60	2	2	8.50	2.27
Total	..	..	..	..	..	19	14	45.48	43.87
No. of Differences Favoring Experimental Group	4	3	4	5	3	19	..	..	..
Control Group	3	4	3	..	4	..	14	..	..
Total Differences Favoring Experimental Group	2.30	1.65	7.93	15.68	17.92	..	..	45.48	..
Control Group	22.93	12.14	3.82	..	4.98	..	..	..	43.87

Of a grand total of 33 differences shown for the five counties, 19 favor the experimental group, and 14 favor the control group.

Of a grand total of 89.35 points of difference, 45.48 favor the experimental group, and 43.87 favor the control group.

TABLE 22

SUMMARY OF EXPERIMENTAL COEFFICIENTS IN ALL FUNCTIONS FOR ALL COUNTIES

Test	County					No. Exp. Coef. Favoring		Total Exp. Coef. Points Favoring	
	Garrett	Allegany	Howard	Harford	Wicomico	Exp. Group	Control Group	Exp. Group	Control Group
Reading, Speed	− 1.79	− .28	− .22	.57	.99	2	3	1.56	2.29
Reading, Comprehension	− .43	− .32	− .18	.63	− .16	1	4	.63	1.09
Spelling	.53	.44	− .06	.35	.22	4	1	1.54	.06
Arithmetic	.02	− .17	.19	.17	− .29	3	2	.38	.46
Language	.06	.09	.98	.11	.52	5	..	1.76	..
Composition, Quality	− .21	.25	.18	..	− 1.60	2	2	.43	1.81
Composition, Speed	.10	− .03	.65	..	− .11	2	2	.75	.14
Total	..	..	..	..	..	19	14	7.05	5.85

No. of Experimental Coefficients Favoring Experimental Group	4	3	4	5	3	19	..	..	..
Control Group	3	4	3	0	4	..	14	..	..
Total Experimental Coefficient Points Favoring Experimental Group	.71	.78	2.00	1.83	1.73	..	..	7.05	..
Control Group	2.43	.80	.46	..	2.16	..	..	..	5.85

Out of a grand total of 33 experimental coefficients shown, 19 favor the experimental groups, and 14 favor the control groups.

Out of a grand total of 12.90 experimental coefficient points shown, 7.05 favor the experimental groups, and 5.85 favor the control groups.

TABLE 23

SUMMARY OF RESULTS IN FOUR FUNCTIONS FOR THE THIRD GRADES OF ALL COUNTIES COMBINED

Test	Experimental Groups			Control Groups			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Reading, Comprehension	176	19.50	3.89	190	13.31	3.54	6.19	5.26	.42
Spelling	184	11.13	.49	196	12.09	.55	— .96	.74	— .47
Arithmetic	180	6.61	.31	199	6.39	.31	.22	.44	.18
Language	196	2.86	.20	205	2.70	.21	.16	.28	.20

Composition is omitted from Tables 23 to 27 because tests in this subject were not given in Harford County.

TABLE 24

SUMMARY OF RESULTS IN FOUR FUNCTIONS FOR THE FOURTH GRADES OF ALL COUNTIES COMBINED

Test	Experimental Groups			Control Groups			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Reading, Comprehension	212	16.10	2.58	219	14.09	2.36	2.01	3.49	.20
Spelling	212	11.26	.44	216	10.28	.47	.98	.64	.55
Arithmetic	212	6.71	.30	221	5.45	.29	1.26	.42	1.08
Language	213	3.07	.20	217	2.09	.21	.98	.29	1.23

TABLE 25

SUMMARY OF RESULTS IN FOUR FUNCTIONS FOR THE FIFTH GRADES OF ALL COUNTIES COMBINED

Test	Experimental Groups			Control Groups			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Reading, Comprehension	241	8.50	1.66	158	13.74	2.15	— 5.24	2.71	— .69
Spelling	239	9.32	.41	162	9.66	.55	— .34	.69	— .18
Arithmetic	234	5.07	.26	162	5.71	.31	— .64	.40	— .57
Language	246	2.39	.18	160	2.19	.23	.20	.29	.24

TABLE 26

SUMMARY OF RESULTS IN FOUR FUNCTIONS FOR THE SIXTH GRADES OF ALL COUNTIES COMBINED

Test	Experimental Groups			Control Groups			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Reading, Comprehension	151	4.60	2.07	150	8.86	2.06	−4.26	2.92	−.52
Spelling	149	7.78	.50	144	6.30	.45	1.48	.67	.79
Arithmetic	149	4.50	.29	151	4.73	.31	− .23	.42	−.19
Language	161	2.11	.20	146	2.17	.22	− .06	.30	−.07

TABLE 27

SUMMARY OF RESULTS IN FOUR FUNCTIONS FOR THE SEVENTH GRADES OF ALL COUNTIES COMBINED

Test	Experimental Groups			Control Groups			Diff.	Sigma Diff.	Exp. Coef.
	No. Tested	Ave. Improvement	Sigma Ave.	No. Tested	Ave. Improvement	Sigma Ave.			
Reading, Comprehension	98	4.90	1.21	90	5.22	2.34	−.32	2.63	−.04
Spelling	89	6.03	.61	86	3.70	.59	2.33	.85	.99
Arithmetic	95	3.63	.35	91	3.90	.41	−.27	.54	−.18
Language	100	2.15	.27	86	1.75	.34	.40	.43	.33

SIGNIFICANCE OF THE RESULTS

From the data presented in the foregoing tables the reader may fairly draw the conclusion that neither group is markedly superior to the other. The children of both groups progressed at nearly the same rate with no decided advantage to either. It is therefore evident that, so far as the statistical aspect of this study is concerned, there is no conclusive evidence one way or the other.

Neither is there evidence to show unfavorable effects upon the children of the experimental groups. This is the significant and important outcome of the experiment. No supervisory practice or school procedure can have any valid claim to consideration if it is found to interfere with the orderly progress of the children in school. If teacher participation in curriculum making or any other extra-class activity makes such inroads upon the teacher's time and energy as to constitute a handicap to the teaching process, the teacher should give less attention to this distracting influence.

The teachers of the experimental groups produced worth-while courses of study, an achievement of which none of them up to that time had been able to boast. This required the expenditure of more painstaking effort than they had ever before given to any professional activity during the school year, and much more than was expected of the control groups during the same period. The inference might be that this was done at a sacrifice of classroom efficiency, since no competent school administrator or supervisor will deny that teaching is a jealous task-mistress, demanding as the price of success whole-hearted and unremitting devotion to the daily duties of the classroom.

The data presented in the foregoing tables do not justify the inference, for in spite of the fact that the teachers of the experimental groups were engaged in the big intellectual project of curriculum making they were not less successful in the classrooms than were those of the control groups. The immediate interests of the children were in no wise sacrificed; even during the year or more of intensive work upon courses of study they made, on the whole, as much improvement as those of the control groups whose teachers enjoyed all the benefits of good supervision except that of constructing courses of study.

Intensive work on the curriculum seemed to be as effective an instrument of supervision as all the other commonly used means of supervision combined. This does not mean that school officials should place their entire reliance upon teacher participation in the formulation of courses of study to the exclusion or neglect of other supervisory procedures. The evidence adduced is not sufficiently conclusive to justify this recommendation. There is, however, ground for the belief that such activity on the part of teachers, if intelligently conceived and faithfully executed, offers exceptional opportunities for professional growth, and that curriculum organization should have a place in every supervisory program for the improvement of teachers in service.

CHAPTER V

A PROFESSIONAL ACHIEVEMENT TEST FOR TEACHERS

At the time this investigation was initiated there existed no standardized measure of the degree of professional knowledge and skill possessed by a teacher or group of teachers. Since it was desired to determine the relative improvement in teaching power and executive ability of the teachers in the experimental groups and the control groups of the five counties coöperating in this study, the writer devised a true-false test, in two parts of one hundred statements each. Grateful acknowledgment is hereby made to Dr. E. L. Thorndike of Teachers College, Columbia University, who assisted in formulating principles to guide in developing the test, and to Dr. F. G. Bonser, Dr. W. H. Kilpatrick, and Dr. W. A. McCall, of Teachers College, who made constructive, helpful criticisms of the preliminary statements.

HOW THE TEST WAS PREPARED

After exhaustive study of standard educational books and periodicals, two hundred fifty-eight statements were formulated. These were given in typewritten form as a preliminary test to three professors at Teachers College, Columbia University, to the principal and ten other members of the faculty of the Maryland State Normal School at Towson, and to a rural school supervisor and fifteen rural teachers of West Virginia, with experience ranging from no experience to fourteen years. Each was asked to mark every statement as directed, and to indicate each statement considered unfair or of doubtful value. Several of these preliminary judges submitted written criticisms which were taken into account in revising or eliminating some of the statements. The test was reduced to 200 statements, which were refined and arranged for use in order of their difficulty. The test was printed in two parts, each part consisting of 100 statements of approximately equal difficulty.

The original list of 258 statements is not here reproduced. Only the final list of Part One which resulted from the revisions made to conform to the suggestions from the several critics who commented upon the statements is included.[1]

The tests were administered in all the counties by the writer in person at the regularly designated teachers' meeting held at the beginning of the school year. No attempt was made to isolate the teachers forming the two groups necessary for the experiment in curriculum making. All the teachers at the meeting were given

HOLLOWAY PROFESSIONAL ACHIEVEMENT TEST

Devised by William J. Holloway
Maryland State Department of Education

Form A

Do not open the blank until you are told to do so. Supply the following information:

(1) .... Last Name
(2) .... First and Middle Names in Full
(3) .... Address
(4) .... County State

(5) Indicate here all the schooling you have had.

Kind of School	Name of School	Location of School	No. Full Years' Attendance	Parts of Years in Months	Summer Sessions in Weeks	Dates of Attendance	Year of Graduation
Elementary School							
High School or Academy							
Normal or Training School							
College or University							

Copyright, 1924, by Wm. J. Holloway,
2014 Lexington Building, Baltimore, Md.

---

[1] Part Two is omitted to economize space. It is on file at the Library of Teachers College, Columbia University, with other data pertaining to this study.

DIRECTIONS

Read the first statement. If it is true, underline the word "True" following the statement. If it is false, underline the word "False." If you do not know, go on to the next one. Do the same with statement 2, and so on with each of the 100 statements.

1. The study period in the schoolroom should be regarded as a rest period for teachers. True False
2. The study period in the schoolroom should be regarded as a rest period for pupils. True False
3. The teacher should prepare daily for all recitations. True False
4. The bright child should be called on to recite more frequently than the slow or timid child. True False
5. Weak places in the pupil's work must be remedied as they manifest themselves. True False
6. Questions should be asked in a conversational tone. True False
7. Questions should be thought-provoking. True False
8. The lecture method of teaching is justifiable in dealing with students of immature experience. True False
9. The teacher should know the specific cause of the pupil's failure. True False
10. A good teacher usually repeats answers of pupils. True False
11. One may be a teacher in the true sense of the word without having anything of her own to add. True False
12. Good teaching can be had without securing efficient motives. True False
13. Every child should be employed in some way during the entire recitation. True False
14. Most of the questions asked by pupils during a recitation should be addressed to the class rather than to the teacher. True False
15. As a rule one should not tell a child what he can be led, by questioning, to see for himself. True False
16. Questions should employ the language of the text. True False
17. The telling method of teaching is reliable. True False
18. The whole class should watch the one who is reciting and if they observe an error in the recitation at once raise their hands. True False
19. When pupils work together in a class, all should be expected to do an equal amount of work. True False
20. If the teacher has the textbook open before him, the pupils also should usually have their books open. True False
21. The reading lesson should aim to give ability to judge the values of what is read. True False
22. All the subject matter in reading for the sixth grade should be taken from one textbook. True False
23. In primary grades a child should complete one reader before taking up another. True False
24. Accuracy along with reasonable rapidity should be constantly emphasized in arithmetic. True False

25. Generalizations in arithmetic should first be stated in the child's own words. True False

26. In arithmetic the teacher should, as a rule, excuse errors if the child seems to understand the principle. True False

27. A child's ability to spell a word orally is a guarantee that he will not misspell it in writing. True False

28. Pupils should be taught all the words appearing in the regularly adopted spelling book. True False

29. The spelling lesson should be based on the child's own written vocabulary. True False

30. Other things being equal, the teacher who relies entirely upon the textbook for material in written English should be rated higher than the one who has the children draw upon other sources. True False

31. In an English period of 30 minutes, teacher A usually spends 10 minutes in talking to the pupils, and the pupils spend 20 minutes in talking; in a similar period teacher B spends 25 minutes in talking, and the pupils 5 minutes. Teacher B is a better teacher than A. True False

32. In literature, Class A has secured a reasonable range of information from its study; Class B has secured the same information and has, in addition, developed an interest in reading more of the same kind of material. Class B was better taught than Class A. True False

33. The study of grammar is more important than the use of language lessons in the elementary school. True False

34. The teacher should teach in geography only the subject matter that is found in the textbook. True False

35. In science, Class A has secured a reasonable range of information from its study; Class B has secured the same information and has, in addition, developed an interest in reading more of the same kind of material. Class B was better taught than Class A. True False

36. History lessons should be assigned by pages. True False

37. In a history period of 30 minutes, teacher A usually spends 10 minutes in talking to the pupils and the pupils spend 20 minutes in talking; in a similar period, teacher B spends 25 minutes in talking, and the pupils 5 minutes. Teacher B is a better teacher than A. True False

38. In history, Class A has secured a reasonable range of information from its study; Class B has secured the same information and has, in addition, developed an interest in reading more of the same kind of material. Class B was better taught than Class A. True False

39. The Hillegas Scale is designed to measure ability in spelling. True False

40. Courses of study should be made by school officials or other experts in education, and teachers required to follow them strictly. True False

41. Arithmetical processes which do not enter into common use should be eliminated from the course of study. True False

42. Since Latin has been successfully taught for several hundred years, it should be retained in the curriculum of public schools. True False

43. Examination questions for pupils should always be made by the county superintendent, and given by teachers to pupils without change. True False

44. Arithmetical processes which have become obsolete should be eliminated from the course of study. True False

45. A pupil who fails in any subject should repeat all the work of the grade. True False

46. A child who fails in oral reading should repeat all the work of the grade. True False

47. The one criterion of fitness for promotion should be ability to meet the requirements of the next higher grade. True False

48. The chief criterion of fitness for promotion should be how well a pupil has done the work of the grade. True False

49. One of the Courtis Scales may be used to measure the achievement of young people in drawing. True False

50. A language scale has been devised by Trabue. True False

51. The child who asks such questions as "Where were all the rocks before they were in the dirt?" and "What does the rain do when it isn't raining?" is more to be commended than the teacher who makes fun of him for doing so. True False

52. All children should give the same time to all studies. True False

53. Good teaching expects, and adapts itself to, wide individual differences in original nature. True False

54. Disagreeable, uninteresting work is most valuable in educating children. True False

55. Teacher A compels her children to learn their lessons through fear of being ridiculed or otherwise punished; Teacher B has her class at work satisfying a personally felt need. If one class knows as much as the other, the first sort of teaching is as satisfactory as the second. True False

56. Every child who is in the seventh grade class in arithmetic should also be in the seventh grade class in music. True False

57. Thinking, or association, is the real key to memory. True False

58. Children have to be forced to think and learn. True False

59. Children who are confirmedly left-handed should draw with the left hand. True False

60. A child who says, "I have no head for arithmetic," may speak the truth. True False

61. The most potent basis of recall is interest. True False

62. The school proceeds properly in attempting to force all children through the adopted course of study. True False

63. The thing that fails to interest a child fails to move him. True False

64. We should try to have children develop equal ability in all of their studies. True False
65. Eight-year-old boys are more anxious to have their side win than to see their own names at the top of the list. True False
66. All children, except possibly some mental defectives, can learn to draw. True False
67. The habit of producing neat papers in arithmetic will cause a child to do equally neat written work in other studies, such as language and spelling. True False
68. The process of representative drawing aids the memory. True False
69. In a noisy school it is a good practice for the teacher to clap the hands to secure order. True False
70. In a noisy school it is a good practice for the teacher to ring a bell to secure order. True False
71. Assigning a lesson to punish a child is a proper procedure. True False
72. The teacher should be required to know the parents and the home life of the children in her class. True False
73. The teacher's manner toward pupils should indicate a high degree of respect. True False
74. Children respect most those teachers whom they feel they must obey. True False
75. All children require the same punishment for the same offense. True False
76. It is as good to scrub and sweep schoolroom floors as it is to oil and sweep them. True False
77. Children should be punished in the presence of other children. True False
78. All misdemeanors seen among those not in the recitation should be rebuked at once. True False
79. During a recitation teachers should be willing, at all times, to answer questions asked by the other pupils. True False
80. Teachers should devote at least one period a day to individual instruction. True False
81. The slower pupils in a class are necessarily lazy. True False
82. In extreme cases corporal punishment for young children is justifiable. True False
83. Children should make the using of knowledge a part of their study. True False
84. Children of six years and older can be taught how to study. True False
85. The child who sits quietly absorbed in solving a problem is more active and more truly active than his neighbor in the next seat who is jumping up and down with glee at getting the answer. True False
86. In most subjects facts vary very greatly in value. True False
87. Study is systematic work. True False
88. Children should generally quote the teacher as authority for their conclusions. True False
89. Supplementing the text is an especially important factor in teaching in primary grades. True False

90. A child may neglect many details in a textbook and still be quite thorough. True False
91. Education should be considered as the filling of empty minds. True False
92. If method of study has been properly taught, assignment of lessons by pages is sometimes fitting. True False
93. Education should be considered as the moulding of perfectly plastic substances. True False
94. The responsibility of deciding what shall be neglected in a study should very often be left with the children. True False
95. In order to maintain low taxes, parents should pay for the education of their own children. True False
96. Compulsory medical examination of school children is justifiable. True False
97. Health is better than strength or grace. True False
98. The only way for teachers to grow professionally is to attend approved summer schools. True False
99. The school is responsible for the moral training of children. True False
100. Education should be considered as a mere preparation for living. True False

the test, but only the scores made by the teachers in the experimental and control groups appear in the tables which follow.

In a further effort to secure uniformity of procedure, and at the same time to remove any embarrassment or hesitancy on the part of the teachers, the same directions were given to all the teachers. They were informed that the test was designed to measure the teacher's general knowledge of methods, management, and educational theory; that no one need hesitate to mark the statements for fear that her standing in her school system would in any way be affected; that scores would be kept confidential and would not be reported to the superintendent, or principal, or other executive officer; hence, a high score would not secure for her any higher rating than she would otherwise be given; nor would a low score prejudice her interests in any way; and that the score made would not even be reported to the teacher unless she requested it.

At the close of the period of the investigation, as many of the teachers as could be got together were given both parts of the test. The difference between the score made in the initial test (Part One) and the average of the two scores (Parts One and Two) made in the final test was taken as the improvement made by each teacher in respect to the functions measured by this test.

Table 28 shows the average improvement of each group, the

PROFESSIONAL ACHIEVEMENT TEST: SCORING KEY, FORM A

1.		False
2.		False
3.	True	
4.		False
5.	True	
6.	True	
7.	True	
8.		False
9.	True	
10.		False
11.		False
12.		False
13	True	
14.	True	
15.	True	
16.		False
17.		False
18.		False
19.		False
20.	True	
21.	True	
22.		False
23.		False
24.	True	
25.	True	
26.		False
27.		False
28.		False
29.	True	
30.		False
31.		False
32.	True	
33.		False
34.		False
35.	True	
36.		False
37.		False
38.	True	
39.		False
40.		False
41.	True	
42.		False
43.		False
44.	True	
45.		False
46.		False
47.		False
48.	True	
49.		False
50.	True	
51.	True	
52.		False
53.	True	
54.		False
55.		False
56.		False
57.	True	
58.		False
59.	True	
60.	True	
61.	True	
62.		False
63.	True	
64.		False
65.		False
66.	True	
67.		False
68.		False
69.		False
70.		False
71.		False
72.	True	
73.	True	
74.	True	
75.		False
76.		False
77.		False
78.		False
79.		False
80.	True	
81.		False
82.	True	
83.	True	
84.	True	
85.	True	
86.	True	
87.	True	
88.		False
89.	True	
90.	True	
91.		False
92.	True	
93.		False
94.	True	
95.	True	
96.	True	
97.	True	
98.		False
99.	True	
100.		False

difference between the improvement averages, and the unreliability of the results.[1] The scores from which these results were derived were computed by subtracting the number of statements incorrectly marked from the number correctly marked, no account being taken of the omissions. (See McCall, *How to Measure in Education*, pp. 121 ff.)

The practical equivalence of the two groups within a given county is further shown (see Chapter III) by a comparison of the mean initial scores as given in Table 28. In two counties the average teacher of the experimental and the average teacher of the control group made almost identically the same initial score, while the greatest difference, 8.3, represents only 4 per cent of the total number of questions in the test.

The following tabulation gives the number of statements in Part One devoted to each of the subjects listed. Approximately the same arrangement is followed in Part Two.

Teaching of Reading	3
Teaching of Arithmetic	3
Teaching of Spelling	3
Teaching of English	4
Teaching of Geography	2
Teaching of History	3
Educational Scales	3
Examinations and Promotions	4
Curriculum Making	5
How to Study	12
School Management	14
Educational Psychology	18
Method of the Recitation	20
Unclassified	6
Total	100

This test has not been used extensively enough to justify a statement of standards which may fairly be expected of teachers. Further experimentation to this end is necessary.

The teachers were allowed all the time they needed to mark the statements. In three of the counties a record was kept of the time needed for each teacher to finish Part One. A study of 127 cases of first grade Maryland teachers (normal school graduates or

---

[1] See text following Table 9 for a discussion of the reliability measures employed in this study.

TABLE 28

IMPROVEMENT IN PROFESSIONAL ACHIEVEMENT MADE BY TEACHERS OF BOTH GROUPS IN THE FIVE COUNTIES

County	Experimental Group				Control Group				Difference	Sigma Diff.	Exp. Coef.
	No. Tested	Initial Score Ave.	Ave. Improvement	Sigma Ave.	No. Tested	Initial Score Ave.	Ave. Improvement	Sigma Ave.			
Garrett....	14	49.5	6.43	2.61	12	41.3	4.50	2.64	1.93	3.71	.19
Allegany..	18	47.0	4.33	1.49	19	46.8	−1.81	2.18	6.14	2.64	.83
Howard...	22	57.6	.91	1.65	10	49.3	−2.00	2.11	2.91	2.62	.39
Harford...	9	53.1	4.83	2.48	7	51.0	.36	2.77	4.47	3.72	.43
Wicomico.	14	50.1	5.00	4.51	12	43.1	3.25	2.61	1.75	5.21	.12

the equivalent), 146 second graders (high school graduates with at least six weeks of professional training), and 106 third graders (less than high school graduation, and six weeks or more of professional training), showed the results which are exhibited in Table 29.

Whether or not a time limit should be set for this test and what it should be if one were required are questions not pertinent to this investigation.

IMPROVEMENT IN CERTIFICATION SCORES

The improvement in the professional status of teachers of both groups, during and immediately following the period of this experiment, was measured in another way. This evaluation was based upon the theory that the impetus to professional growth gained through participation in curriculum making, as given in the testimony of the teachers themselves, would tend to stimulate the teachers to raise their certification rating by means of further study at accredited institutions. This theory may not be well grounded on fact.

The extent of training was ascertained by consulting the records of the education and experience of the teachers concerned, which are on file in the Office of the State Department of Education. The number of years of schooling beyond the elementary grades, with which each teacher was credited, was noted as of September 1, 1920, and again, as of June 1, 1923. This represented the period of this investigation, and two years thereafter.

TABLE 29

DISTRIBUTION OF THE TIME REQUIRED FOR TEACHERS TO MARK 100 TRUE-FALSE STATEMENTS IN PROFESSIONAL ACHIEVEMENT TEST, PART ONE

Time in Minutes	No. of 1st Grade Teachers	No. of 2nd Grade Teachers	No. of 3rd Grade Teachers
5	..	..	..
6	..	..	..
7	..	..	..
8	..	..	..
9	1	..	..
10	4	6	2
11	3	..	1
12	9	5	3
13	5	8	2
14	7	11	9
15	15	14	12
16	5	12	11
17	12	12	8
18	13	10	12
19	10	11	8
20	10	14	9
21	6	4	7
22	12	11	4
23	2	8	3
24	6	2	5
25	2	6	3
26	3	..	..
27	1	2	5
28	..	2	2
29	..	3	..
30	..	4	..
31	1	..	..
32	..	1	..
33	..	..	..
34	..	..	..
35	..	..	..
Total	127	146	106
Q_1	15.2	15.5	15.8
Median	18.2	18.5	18.4
Q_3	21.2	22.2	21.4
Q	3.0	3.4	2.8

All teachers' certificates in Maryland are issued by the state superintendent of schools. In the evaluation of credits, six semester hours of academic and professional training in an approved summer school, extension course, directed reading circle study club, etc., are rated as equivalent to one-fourth of a year.[1]

The facts are presented in Table 30. The figures presented in this table indicate that the teachers of the experimental groups were, on the whole, a little more zealous in attendance upon summer schools, extension courses, reading circle clubs, and the like, with a view to securing a higher grade of certificate, than were those of the control groups, but the claim will not be made that their participation in curriculum making was alone responsible for this showing. Other factors doubtless had influence, such as the prospect of a salary increase and added prestige resulting from a higher grade of certificate, attendance upon summer school as a condition of renewal of a certificate, advice of superintendent and supervisor, example of other teachers, etc.; but, since the curriculum making groups had been disbanded, and supervision was again in operation for all teachers alike, the teachers of both groups were equally subject to the influence of these factors. It does not seem amiss, therefore, to ascribe the greater degree of academic and professional training secured by the teachers in the experimental groups to their curriculum making experience.

TABLE 30

IMPROVEMENT IN TRAINING OF TEACHERS FROM THE BEGINNING OF THE EXPERIMENT THROUGH A PERIOD OF THREE YEARS

County	EXPERIMENTAL GROUP			CONTROL GROUP			Difference in Years	Sigma Diff.	Exp. Coef.
	No. of Teachers	Ave. Improvement in Years	Sigma Ave.	No. of Teachers	Ave. Improvement in Years	Sigma Ave.			
Garrett.......	23	1.08	.24	18	.28	.10	.80	.26	1.11
Allegany......	17	.72	.22	20	.42	.04	.30	.22	.49
Howard.......	25	.27	.09	22	.20	.04	.07	.09	.28
Harford.......	11	.66	.25	8	.28	.07	.38	.26	.54
Wicomico.....	17	.80	.15	11	.26	.05	.54	.16	1.21
									3.63

---

[1] Bulletin, *Teachers' Certificates*, Maryland State Department of Education, Vol. 2, No. 1, February, 1921. (Reading circle study clubs were later discontinued.)

CHAPTER VI

COUNTY COURSES OF STUDY

Courses of study were constructed by the experimental groups in five counties as follows: Garrett, Arithmetic and Reading; Allegany, Reading and Spelling; Howard, Arithmetic and English; Harford, Reading; Wicomico, Arithmetic.

All of these courses of study were planned for rural ungraded schools.[1] In addition to these, courses of study were produced for particular schools, two in number, namely, Olney, a one-teacher school in Montgomery County, and Bruceville, a two-teacher school in Talbot County. The courses of study in each case grew out of a social, economic, and educational survey of the community and the school.

These courses of study were evaluated by competent critics. The critics included a normal school faculty under the leadership of an expert in curriculum making, a nationally known expert in the teaching of arithmetic, and several highly trained supervisors of elementary schools. Their opinion may be condensed into one extract from their report: "The several courses of study under discussion are workable, well adapted to the purposes for which they were intended, and at least two of them possess exceptional merit."

As a further measure of the worth of the courses of study reported in this discussion, efforts were made during the summer session of 1926 and the following winter session to have the courses evaluated by students of the Bureau of Curriculum Research at Teachers College, Columbia University. It was found impossible to secure the services of such students without unjustifiable imposition upon their time. Recourse was then had to experts in elementary education in service in Maryland. Two county supervising teachers, both women, and two State Normal School professors, one man and one woman, volunteered to judge the courses and did so in a thoroughgoing manner. Following is the training and experience of these judges:

---

[1] The volume of these courses of study render it inexpedient to include them in this report. They are on file at the Library of Teachers College, Columbia University.

No. 1 — B.S., State Teachers College; M.A., Teachers College, Columbia University. Experience: 14 years in one-room school; high school principal; county superintendent; head of mathematics department of high school; supervisor of rural practice teaching and professor, State Normal School; college and university summer school faculties, 5 sessions.

No. 2 — B.S., University of Chicago; M.A., Columbia University. Experience: 20 years as supervisor and teacher in State Teachers College and State University; head of college department of education; supervisor of rural and city schools; chairman of groups of teachers working on courses of study.

No. 3 — B.S., State Teachers College; M.A., Teachers College, Columbia University. Experience: 12 years as grade and high school teacher and principal; elementary school supervisor; summer school faculties, 2 sessions.

No. 4 — B.S., Teachers College, Columbia University; summer sessions at State University and Teachers College, Columbia University. Experience: 13 years as grade and high school teacher; teacher-training department, and principal of high school; elementary school supervisor; summer faculty, State Teachers College, 2 sessions.

These persons all came into Maryland positions after the completion of the experiment upon which this study is based. Their freedom from bias in regard to the courses which they judged, their rich and varied training and experience, and their known reputation for fairness and probity fully justify the belief that their judgments are fairly accurate and reliable. The criteria (Form A) for evaluating elementary school courses of study devised by the Bureau of Curriculum Research of Teachers College, Columbia University,[1] were employed, the Bureau willingly coöperating and furnishing the necessary rating blanks.

The judges noted the presence of the particular features listed in the several criteria used for evaluating specific courses but these reports are not listed in the summaries which follow since space forbids giving them in detail. Table 31 gives the results of the scaling of the several features, and the writer believes this to be the significant thing and quite sufficient for the purposes of this report. The table is to be read as follows: The four judges scaled the course in reading for Garrett County a total of 115 times, it being rated excellent 9 times, very good 14 times, good 39 times, fair 39 times, poor 14 times. The arithmetic average is to be found by dividing these numbers by 4; *i.e.*, the course is rated excellent in respect to 2¼ particulars, very good in respect to 3½ particulars, and so on. The general evaluation of the course is fair by two judges, good by one judge, and very good by another. The figures for the other courses are to be interpreted in the same manner.

---

[1] Stratemeyer, F. B., and Bruner, H. B., *Rating Elementary School Courses of Study.* Bureau of Publications, Teachers College, Columbia University, 1926.

TABLE 31

RATING OF EACH COURSE OF STUDY ACCORDING TO THE CRITERIA PROPOSED BY THE BUREAU OF CURRICULUM RESEARCH, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

County	Course	Combined Ratings by Four Judges of the Several Features in the Criteria							No. of Judges Giving Each Rating				
		Ex	Vg	G	F	P	Total	Not in Course	Ex	Vg	G	F	P
Garrett.......	Reading	9	14	39	39	14	115	17		1	1	2	
	Arithmetic	2	6	61	28	3	100	35				4	
Howard.......	Reading	0	7	19	40	28	94	35				1	3
	Arithmetic	0	12	25	45	6	88	35				3	1
Harford.......	Reading	17	21	41	26	4	109	18	1		1	2	
Wicomico.....	Arithmetic	26	28	51	15	3	123	23	1	2	1		
Montgomery Olney School	Reading	45	61	16	6	4	132	2	2	1	1		
Talbot Bruceville School.....	English and Literature	24	22	31	20	8	105	28	1	1		2	
	Arithmetic	32	27	29	5	3	96	29	2	1	1		
	Industrial Arts	20	15	26	4	2	67	21		3	1		

Allegany County does not appear in this tabulation for the reason that the two courses of study undertaken in that county were not completed during the period of the experiment.

GENERAL CONSIDERATIONS

The evaluation of the judges as given in Table 31 indicates that the courses of study produced under the conditions of this experiment were of a reasonably high order of merit. Through attendance upon many of the meetings of the experimental groups and through frequent conferences with the supervisors during the progress of the experiment, the writer kept in close touch with the procedures employed. He is convinced that the production of these courses of study called forth the teachers' best efforts, sustained through a long period of time.

Where did the teachers participating in this study secure their curriculum materials? Most of them followed the less scientific method of assembling personal likings for subject matter by borrowing materials from courses previously used, from those used elsewhere, and from textbooks.

What teachers put into their courses of study is, of course, extremely important; but the significant fact here is that so many teachers, many of whom were untrained in a large sense, were able to put anything at all into a course of study and make productive use of it in their regular work. The discovery to them of their latent powers, the stimulation to professional growth, and a keener realization of the dignity and worth of their profession were worth as much, certainly, as the mere production of a commendable course of study. School officials can find worthy courses of study ready-made, but true professional spirit is comparatively rare and cannot be so easily appropriated. Nor was their initiative in the true sense of the word inhibited by their use of ideas of others as set forth in existing curricula. They depended upon others, but they exercised a "reasoned dependence" which marks the truly initiating mind.

Following the lead of a recognized good course is good practice. Initiative in curriculum making does not necessitate the creation of something out of nothing. Initiative does not exist in an intellectual vacuum. Thorndike says: "In our day and manner of life, independence consists in choosing whom to follow rather than in following one's own devices." And, again, "readiness and ability to begin to think and experiment" might, in our thinking about education, replace the word "initiative."[1] This sort of initiative, at least, was well displayed by the teachers who participated in this experiment. The administrative or supervisory directing officer in charge of curriculum organization in each county went about the work in true democratic, coöperative fashion. The open-minded attitude prevailed; ideas and suggestions were gathered from all possible sources; and in the light of the pooled knowledge and experience of each experimental group, these were adapted to the felt needs of the schools for which the respective courses of study were being formulated. There resulted in each case a course of study which had the understanding and the sympathy of the teachers who produced it, and there was developed that fine professional zeal which is necessary in order to insure the effective administration and continuous improvement of any course of study.

[1] Thorndike, E. L., *Education for Initiative and Originality*, pp. 10, 11.

CHAPTER VII

SOME CONCLUDING OBSERVATIONS

Whether or not teachers in service can be depended upon to make any worth-while contributions to the course of study has been a matter of opinion. Innumerable statements for and against teacher participation have been made, but they have so far been only empirical judgments. There have been no scientific studies to determine the feasibility of entrusting to teachers in general, such as may be found in an average county or city system, the task of formulating courses of study for their school systems. As a result of the investigation upon which this report is based, the writer believes that such teachers may be relied on to make worth-while contributions to courses of study, to their own benefit and to the benefit of the children in their schools.

It is claimed by some that few teachers have the necessary training and experience to participate effectively in the organization of curricula. It is the old argument of the divine right of the upper classes. The ignorant are born with only the right to obey. John at Runnymede, Charles I at Whitehall, and Wilhelm at the Marne, are a few of the autocrats who were disillusioned. The autocrat in the superintendent's office who by weight of authority attempts arbitrarily to impose a self-made curriculum upon his teaching staff will find that the onward sweep of democracy has had its due effect upon the morale of those upon whom he must depend to make his policies effective. School superintendents also "derive their just powers from the consent of the governed." The fiat-made curriculum is foredoomed to failure.

In the experiment reported in this discussion, special care was taken to discover and develop teacher-initiative. What is initiative? What is initiative in curriculum making? How many people have initiative? When can one really exercise initiative?

John Dewey, in the *Cyclopedia of Education*, gives the following definition of initiative:

> A term denoting originality and independent force as factors to be maintained and secured in education. Initiative is etymologically connected with

the word "initial"; namely, something at the beginning or outset. It thus refers to the ability to originate, to undertake independently, some desired line of action. It is opposed to mere docility, passiveness, imitativeness, and other conceptions that denote dependence upon others in entering upon a new course of action. The demand for initiative as an indispensable part of the educational aim is coincident practically with the growth of democracy.

See, also, Activity, Individuality, and Freedom.

How much real originality or initiative is there in the best of teachers? Let the reader examine any production or work of his own which seemed very original to him at the time and he can doubtless trace its origin and much of its development to some previous experience. Often the whole is pieced together from many experiences. The more experiences one has the more ready he is to exercise initiative. A meager experience never stimulates initiative. Just as we need many facts before we can really think,[1] so, too, we need many right experiences before we can exercise initiative.

No one will doubt that "We learn to do by doing." A machine is best understood by the one who made it, or at least remade it. A scientific experiment is of real value only when the learner has himself performed it. Knowledge learned must be experienced by actual operation. It is important that a course of study contain the right things, but equally important from the standpoint of teacher growth is what is done in getting it ready. Making a course of study is like making a prayer; it benefits most the one who makes it.

The importance of the course of study justifies the employment of experts in its preparation. The teacher is one of the experts. She it is who guides the children, and who understands, as no one else can, their needs and capacities.

Curriculum making helps to change the status of the teacher in the community. The patrons find out that something is going on that is of real benefit to the children. The interests of the children are being served more effectively than ever before. The teacher proves herself to be of real value to the community, and by showing the people that their support is needed, she moves from the outer fringe to the center of the social group. Such an experience has been enjoyed by every teacher who has honestly tried to make her teaching fit the needs of the community.

The teachers working in the classrooms of our public schools, if afforded opportunities to do so, will contribute ideas that may have a determining influence upon educational progress. In many of the best school systems in the country, through teachers' councils, through committees, through voluntary associations, and through individual recommendations, teachers have concerned themselves with the larger problems of educational administration to the great benefit of the schools. The best way to win teachers is to give them work to do that will make them feel they are working with the superintendent on common problems.

---

[1] Dewey, John, *How We Think*, and Miller, *Psychology of Thinking*.

This participation by teachers is indispensable to the best development of the public schools. Next to the provision of better salaries for teachers, nothing will do more to raise the status of the profession and make its service attractive to the kind of men and women that the schools need than the adoption of a policy that will lift the classroom teacher above the level of a mere routine worker carrying out in mechanical fashion plans and policies that are handed down from above.

Education for life in a democracy such as ours requires that teachers must know democracy. They cannot teach what they have not learned. School officials, through their administrative and supervisory activities, must give teachers the same opportunity to enjoy the benefits of democracy as the teachers through classroom procedure are expected to grant to their children.

Since this study was undertaken, Maryland has made remarkable advances in supervision.[1] Every county now is authorized to employ one supervisory official for every fifty teachers. Curriculum making has everywhere received increasing emphasis. The testimony of supervisors throughout the state who have given serious attention to this activity is to the effect that the construction of a course of study surpasses all other forms of a supervisor's activities in immediately influencing instruction. Many have found that a teacher, even one with little training, who becomes interested in making a course of study for her school will noticeably increase her efficiency in a short time. The construction of a course of study is a project above all others in which a teacher learns by doing. It is one educational project that is never completed, and is, therefore, a never-ending source of inspiration for growth. It is growth not only of the teacher but it means growth which must necessarily result in improved behavior on the part of the children instructed.

---

[1] *Annual Reports*, Maryland State Board of Education, 1923, 1924, 1925, 1926.

1920
S. H. S. T. C. LIBRARY

SAM HOUSTON STATE UNIVERSITY
0 2118 00896 7422

DATE DUE

GAYLORD
PRINTED IN U.S.A.

Date Due

~~JUL 01 1980~~			

25965 2 LB1570
.H6

Holloway, W. J.

Participation in curriculum making as a means of supervision of rural schools.

PRINTED IN U.S.A.